

AMENDMENTS TO THE DRAWINGS:

Please substitute the attached Replacement Sheet for the corresponding sheet in the originally filed drawing containing FIGS. 16 and 17.

Attachments: Replacement Sheet-Page 6/6, FIGS. 16 and 17.

REMARKS

In the Office Action mailed November 3, 2004, the Examiner objected to FIG. 17 and required a corrected drawing in compliance with 37 C.F.R. 1.121(d). The Examiner rejected claims 1 and 3-8 under 35 U.S.C. § 103(a) over Tsai et al. (U.S. Patent No. 6,117,726, hereafter "Tsai") in view of Shiho et al. (U.S. Patent No. 6,238,96 B1, hereafter "Shiho"); and rejected claim 2 under 35 U.S.C. § 103(a) over Tsai, Shiho, and Nitayama et al. (U.S. Patent No. 6,236,079 B1, hereafter "Nitayama").¹ Applicants have cancelled claims 1-8, withdrawn non-elected claims 9-16, and added new claims 17-24.

The attached sheet of drawing includes an amended FIG. 17, now labeled as "Prior Art," as required by the Examiner. Accordingly, Applicants respectfully request the Examiner withdraw the objection to FIG. 17.

Claim 17 recites, in part:

a trench capacitor comprising. . . a first doped polysilicon layer . . . doped with a first impurity having a first conductivity type; a second doped polysilicon . . . doped with the first impurity having the first conductivity type; a third doped polysilicon layer . . . doped with a second impurity having the first conductivity type, the second impurity being different from the first impurity and having a greater diffusion coefficient than that of the first impurity; and a fourth doped polysilicon layer . . . doped with the first impurity having the first conductivity type

Emphasis added.

As can be seen in FIG. 3K and the corresponding description of Tsai, conductive material buried in a trench includes a first conductive portion 370 and a third conductive portion 372, and each of these conductive portions is composed of As-doped polysilicon

¹ The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement or characterization in the Office Action.

or P-doped polysilicon. It may be considered that the doping combinations for the first and third conductive portions 370 and 372 are (As-As); (As-P); (P-P); and (P-As). However, it is not disclosed in Tsai that the first and third conductive portions 370 and 372 are doped with the different impurities such as P and As.

In a disclosed embodiment, a trench capacitor comprises the first to fourth doped polysilicon layers, and the third doped polysilicon layer is doped with P which has greater diffusion coefficient than As. Since the boundary of the buried strap junction is covered with P as described on page 12, lines 20-27 of the specification, this construction has the advantages of reducing a junction leak and enhancing the data holding characteristics. In addition, the object and the structure of the reference are different from those of the disclosed embodiment.

Accordingly, Tsai fails to teach or suggest at least a "first doped polysilicon layer doped . . . with a first impurity having a first conductivity type," and "a third doped polysilicon layer . . .doped with a second impurity having the first conductivity type, the second impurity being different from the first impurity and having a greater diffusion coefficient than that of the first impurity," as recited in claim 17. Thus, claim 17, and claims 18-24 which depend therefrom, are allowable over Tsai.

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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